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EFFECTS OF YOGA PRACTICE ON OVERCOMING THE STRESS

Abstract: *In this article, the beneficial effects of yoga practicing to ability of adequate stress response were analyzed. The initial hypothesis was that non-difficult yoga exercise, breathing techniques and relaxation lead to the better tolerating of stressful life situations and to the overcoming of leaking of well-balanced state and feeling of disability. All these benefits would lead to the better insight in problem solving, possibility of energy restoring and efficiency in every-day's living. Also, the one acquires the better insight in its own perception, reactions and behavior in life situations, which enables the overall overcoming the stress.*

The emotional condition of participants was evaluated using the instrument Profile Index Emotion – PIE (Plutchik and Kellerman, 1974), Yugoslav revision and standardization (Kostić, 1997), which measures eight dimensions, and their scores were compared along these dimensions. The research was conducted during 2009. with the sample of 30 yoga instructors and 30 persons that wasn't practicing yoga nor relaxation techniques, of both genders and different education level, aged from 25 to 61.

Statistically significant differences between the group of yoga instructors and group of participants not-practicing yoga were noted, particularly in three dimensions: Depravity, Aggressiveness, and Exploration. This research points out that the following characteristics were more pronounced in the group of yoga instructors: satisfaction with one's personality, feeling for sense of living, absence of emotional tension, direction to the present, foundation in reality, and perspective way of looking to the future. We could conclude that yoga practicing, including yoga ananas, breathing techniques, meditation and relaxation, contribute to the better responding to stressful situations which became daily challenge. Also, better emotional stability, absence of feeling of denying and destruction, and conciseness on reaction principals were also achieved.

Key words: *yoga, relaxation, stress, health, personality*

Stress

The concept of stress was firstly defined in 1936, by Hans Seyle, endocrinologist from Montreal, in his study on adaptivity system, as the “state of non-specific tension in living organism which occurs as reaction on environmental influences”¹, “non-specific response of body to any demand for change”², Seyle understood that changes in organs and endocrinous system (controlled by hypophysis) has protective character and are aimed to move all resources within the organism to prepare to overcoming the disturbing influence.

Definitions of stress

Stress is the state or feeling of a person who considers that the every-day's demands overcomes his/her ability to respond adequately. That state of long lasting tension leads a person to physiological

¹ Nedić, O., Filipović, D., Solak Z. (2001): Profesionalni stres i kardiovaskularne bolesti kod zdravstvenih radnika, Novi Sad, Medicinski pregled.

² Nedić, O., Filipović, D., Solak Z. (2001): Profesionalni stres i kardiovaskularne bolesti kod zdravstvenih radnika, Novi Sad, Medicinski pregled.

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changes, with negative consequences to health condition, causing the feelings of frustration, mental and physical exhaustion.

Šverko, B. et al. (1992) reported that, in psychological sense, "stress is a condition which appears in persons coping with situations that they consider as a threat for their own good, or with situations when their additional efforts are necessary"³.

It is also believed that the stress is anything that asks for adaptations, any change in our life circumstances, either positive or negative. Even the thinking about (a thought) or sensing the change (an emotion) cause stress.

The same which is very stressful situation for one person, could be the small inconvenience for another, or even pleasure for some other person (weeding, promotion). It was registered that individuals don't have the sense of stress when they have enough time, experience and resources to cope with a particular situation. Therefore, the amount of stress is individual evaluation and depends on personal capacities of an individual in certain situation, on his/her life perspective and ability to respond productively to different stages, changes and demands in life.

Sources of stress

The circumstances that cause stress are named as stressors ('hitters'). This could be any change of energy state that excites the receptors. Stressors of high intensity and long lasting have negative effect, because they cause strong stress reaction and they can easily lead to the breakdown of protective vigour. Intensity of stress reaction often depends on the fact if its effect could be neutralized or amortized. Some of stressful situations could be avoided. However, for the individual it is not beneficial to avoid all stressful situations, because only successful coping with these challenges could make a proper response for future similar situations, the one is achieving life skills, and self confidence and self respect.

Lazarus and Folkman⁴ describe four types of stressors, or sources of stress. These are:

- Acute, timely restricted stressors (jumping with parachute, waiting for surgery, face to face with wild animal)
- The chain of stressors, or events which appear during a long period as a consequence of some initial event such as loss of job, divorce or death of a close person.
- Chronic interrupted stressors, as conflict visits to relatives or sexual disorders which occur once a day, once a week, or once a month.
- Chronic stressors, as permanent invalid state, parent's arguing or chronic stress at job, which can, but not necessarily, be caused with some particular event, and they last for a long period.

Health consequences of stress and possibility of overcoming

The long lasting psychical stress causes psychosomatic disorders. Biochemical reactions begin in hypothalamus and hypophysis area. The final result of these actions is stimulation of adrenal gland and hyper production of adrenalin, caused by activation of sympathetic part of vegetative nervous system. After several seconds, the heart rhythm became faster, muscles get in tension, the pupils spread, and the glucose from liver and muscles releases. This is the way how the organism prepares for fight or running away, by increased amount of sugar in muscles, faster heart rhythm, narrowing of blood vessels, increasing of gastric acid, and increasing of overall alert of organism.

The stress symptoms ring a bell that something is wrong. They are the reflection of overall mobilization of defense vigorous of body, and shouldn't be diminished. They come in different phases of

³ Lazarus, R.S., Folkman, S. (2004): *Stres, procjena i suočavanje*, Jastrebarsko: Slap

⁴ Lazarus, R.S., Folkman, S. (2004): *Stres, procjena i suočavanje*, Jastrebarsko: Slap

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stress exposure and could be of different intensity. The stress symptoms are well recognizable in the area of thinking, emotions, physical health and behaviour⁵.

Emotional blockade, caused by fears and anger make the stomach and thorax, which disables proper breathing. The breathing becomes inadequate, superficial, interrupted, shortened. The thoughts also become confuse and fast, and it is hard to find the solution for the situation.

Yoga techniques

Hatha yoga techniques significantly contribute to the psychosomatic health. It represents an assemblage of techniques which influence to the flexibility of the spine, internal organs, endocrinous system, cardio-vascular system. Using the hatha yoga techniques, the practitioner puts his efforts to get a body which is an adequate instrument for harmoniously functioning of mental activities. Devotional and long lasting practicing of yoga could bring back to the body its natural ability of self-regeneration. Every-day's dedication of time to these simple techniques which needs the deep brings back the life pulsation to every cells, so they become regenerated and released of the difficulties caused by every-day's duties of speedy life.

It is recommended to the practitioner to practice withing the range of pleasure, as his body allows, and during the time body widens its borders, without any pressure. The exercise are to be practiced with full attention to the place of action, the practitioner follows the reactions of his body, and achieves the ability to manage these reactions instead of their management over us and our lives. Appropriate breathing is very important, which means that person has to breath completely, with each exhale to move out all used air, and to move in the maximal amount of fresh oxygenated air with each inhale.

Practitioner can often feel significant benefits, if they used to have troubles caused by fatigue, stress and insomnia. They begin to notice that they have breathed only with the lungs' peaks, and that their brain and other organs didn't receive enough of oxygen. In certain positions, the nerval endings, and the tiny muscles are being engaged, so the body can feel a lot of benefits from these actions. The new pulsation within the organism starts.

Asanas are the positions in which the body can stay without effort, with muscles relaxed, breathing continuously and with attention being directed to the place of action, the place of stretching or strategic place for particular position⁶.

Asanas are the only one part of yoga, but for the men from west world who sits for the most of day, they represent the major part of yoga practicing, having the fast and visible effect and preparing the practitioner for the other parts of yoga.

Sports and gymnastics which are based on external effects are the most effective in muscle development, while 'asanas influence the deepness of our inner world, on the one side physically (internal organs, endocrinous system, brain, willing and vegetative nervous system), and on the other side on mental area where they brings us the peace and equanimity which doesn't exclude dynamics and joy. Over the practicing of yoga, we achieve incomparable flexibitly, amazing endurance, without any fatigue or slackness. Besides, the asanas are extraordinary exercise for full concentration⁷.

Importance of the yoga breathing

To live means to breath – to breath means to live⁸. The breathing is the well-known technique for decreasing the tension, relieving the stress, relaxing. When the person come to the situation that

⁵ Lazarus, R.S., Folkman, S. (2004): *Stres, procjena i suočavanje*, Jastrebarsko: Slap

⁶ Nikić, P. (1999). *Priručnik za kurs za instruktore joge*, Beograd, Akademija samousavršavanja.

⁷ Lizbet, A. (196x) *Učim jogu*, Zagreb, Sportska tribina.

⁸ Lizbet, A. (196x) *Učim jogu*, Zagreb, Sportska tribina.

overcomes the persons' abilities for reacting, he usually stays for a second to make several deep inhales and exhales, to clear the mind, release the tension and to be able to think on upcoming steps.

The majority of population breath badly or wear clothes which limits the movements of abdomen and thorax, especially ladies – they breath only with lungs' peaks. In yoga, we distinguish three sorts of breathing: abdominal, toracal and clavicular breathing. Total yoga breathing combining all three sorts and represents the ideal kind of breathing.

The adequate way of breathing is extremely important for calming the heart beating, relaxing the tension and decreasing the stress. Proper breathing should be practiced without any effort. Ideal breathing is deep, slow, quiet and easy, and the exhale is twice longer than inhale. Total yoga breathing (three layered breathing) has effects to plexus solaris, heart, blood vessels, brain and other organs providing overall health condition, physical and emotional.

With breathing we provide the properly functioning of all body and brain functions, we bring the oxygen to the each cell in the organism, while we eliminate the carbon-dioxide.

Yoga active relaxation

Relaxation or energetic restoring is the way to achieve complete physical, emotional and mental relaxation. Relaxation in yoga of yoga nidra is the one of the most powerful methods of relaxation. The person in modern world thinks that he relaxes and relieves while reading, watching TV, smoking, drinking coffee – the senses are completely occupied, the mind is directed to the outside, which don't fit to the scientific definition of relaxation. In yoga, even sleeping can not be truly relaxation. The presence of awareness, the senses must be quiet, retreated from the outer world, and then the relaxation could be used for the development of better memory, increasing of creativity, better attention to the point, transformation of our own nature. The realising from tension, relaxation and the spirit are the secret of change. When the person is in tension, his behavior is changed as well. The real nature of a person appears in the stages released of tension.

Object, aim and methods of research

In this article we are discussing the possibility that the long lasting practicing of yoga can increase the ability of adequate stress response, which is the part of every-day's life. The research is conducted with the group of yoga instructors which practice yoga for a several years, though every-day's practicing the postures, breathing techniques and relaxation techniques. The another group of participants in this research were the individuals who didn't practice yoga. The both groups were tested with PIE test for personality, which measures eight dimensions (Incorporation, Protection, Orientation/Uncontrol, Depravity/Deprivation, Opositionality/Rejecting, Aggressiveness, Research/Exploration and Reproduction), and their scores are compared along these dimensions.

The aims of this research are:

- 1) To determine hypothesized relationship between two variables, yoga practicing and stress resistance.
- 2) To determine hypothesized relationship between yoga techniques (asanas, breathing techniques, relaxation) and the characteristics of the personality which imply the higher or lower stress resistance.

To achieve these aims, we postulated following hypotheses of research:

- 1) The stress resistance is higher in persons who practice yoga techniques than in person who don't practice, i.e. There is statistically significant difference in stress resistance between individuals who practice yoga and individuals who don't practice yoga.
- 2) Self-satisfaction, the feeling of sense of life and absence of emotional tension is higher in the group of yoga instructors.
- 3) Orientation to the present, foundation in reality and perspective looking into the future were more pronounced in the group of the yoga instructors, experiencing the yoga techniques during the years (asanas, breathing techniques, meditation and relaxation).

In this research the variable (factorial), uni-factorial, bivalent plan with independent groups (unrepeated factor) is used.

The sample consists of 60 informants, two groups of 30 informants each. In the first group were included yoga instructors, as the informants who practice yoga, breathing techniques, meditation and relaxation for a long period (4-15 years). This sample was eligible, since it is homogeneous in regard to measured variable. In the second group were included volunteer informants, not-practicing yoga, and this sample was equable by age with the first group. Subjects were aged from 25 to 61 years, 42 women and 18 men.

Control variable in this research in the age of informants.

Independent variable (factor) is the yoga practicing. Two levels of factor are: a) informant practice yoga, b) informant don't practice yoga

Dependent variable is stress resistance (ability of adaptation in stress situations) measured with PIE test (Profil Index Emotion) which measures eight dimensions (see above).

In data analysis we used the methods of descriptive statistics, Chi-square test, t-test for independent samples and analysis of variance.

Results and discussion

Results acquired using the test Profile Index Emotion (PIE)

For evaluating if the difference by gender in both groups is significant (the sample was not equable by gender, only by age), we determined the frequency of women and men in the sample, as shown in Table 1. It is shown that the sample was consisted of 30% men and 70% of women.

Chi-square test showed as following:

Chi-square test for **control group** showed that there was not significant differences by the gender of informants. Chi-square test for **criteria group** is statistically significant. We can note that there is statistically significant difference by gender in criteria group, i.e. that the yoga instructors are predominantly women. Chi-square test for difference between the number of women in criteria and control group is not statistically significant. Chi-square test for difference between the number of men in criteria and control group is statistically significant, i.e. in control group there is significantly higher number of men than in criteria group.

As the measure of dependent variable, for each group of informants, the arithmetic means were noted for eight dimensions of PIE test. Considering that the plan of research is of variable kind, for the statistic analysis of data we applied the analysis of variance. Statistical significance was tested with t-test.

To determine if there were significant differences by gender in measured variables, we applied **analysis of variance between genders**.

Table 1. Descriptive statistics for measured variables by gender

	gender	N	Arithmetic mean	Standard deviation
Reproduction	Men	18.00	84.72	13.34
	Women	42.00	87.74	13.49
Incorporation	Men	18.00	73.94	20.36
	Women	42.00	77.14	14.51
Uncontroll	Men	18.00	60.28	17.36
	Women	42.00	63.21	15.33
Self-protection	Men	18.00	47.00	15.88
	Women	42.00	47.71	15.17
Deprivation	Men	18.00	35.56	16.62
	Women	42.00	31.67	13.28
Opositionality	Men	18.00	31.28	9.19
	Women	42.00	29.81	13.88
Exploration	Men	18.00	41.28	12.15
	Women	42.00	51.07	13.52
Aggressiveness	Men	18.00	36.56	14.08
	Women	42.00	29.14	12.07
BIAS	Men	18.00	68.67	10.08
	Women	42.00	71.62	8.66

Table 2. Significance of differences between men and women.

	T-test for independent samples		
	T	df	Significance
Reproduction	-0.796	58	0.429
Incorporation	-0.691	58	0.493
Uncontroll	-0.653	58	0.516
Self-protection	-0.165	58	0.87
Deprivation	0.963	58	0.34
Opositionality	0.411	58	0.683
Exploration	-2.764	35.648	0.009
Aggressiveness	2.073	58	0.043
BIAS	-1.152	58	0.254

As shown in Table 2, the differences in two dimensions between women and men are significant (analysis of variance). Analysis of variance shows that there are statistically significant difference between men and women in dimension Exploration – women have significantly higher score. In the dimension Aggressiveness, men had higher score than women.

Analysis of variance between the groups was done to determine if there were statistically significant difference between criteria group – yoga instructors and control group – informants not practicing yoga, in dimensions of PIE test.

Table 3. Arithmetic means and standard deviations of measured variables by groups.

	Group	N	Arithmetic mean	Standard deviation
Reproduction	Control group	30.00	86.33	12.38
	Yoga instructors	30.00	87.33	14.55
Incorporation	Control group	30.00	77.83	12.76
	Yoga instructors	30.00	74.53	19.40
Uncontroll	Control group	30.00	62.00	16.38
	Yoga instructors	30.00	62.67	15.63
Self-protection	Control group	30.00	45.43	17.28
	Yoga instructors	30.00	49.57	12.89
Deprivation	Control group	30.00	37.00	12.64
	Yoga instructors	30.00	28.67	14.91
Oppositionality	Control group	30.00	29.90	10.16
	Yoga instructors	30.00	30.60	14.81
Exploration	Control group	30.00	44.23	11.73
	Yoga instructors	30.00	52.03	14.75
Aggressiveness	Control group	30.00	34.80	13.14
	Yoga instructors	30.00	27.93	12.21
BIAS	Control group	30.00	68.83	9.60
	Yoga instructors	30.00	72.63	8.34

Table 4. Significance of differences between criteria and control group.

	T-test for independent samples		
	T	df	Significance
Reproduction	-0.287	58	0.775
Incorporation	0.778	58	0.44
Uncontroll	-0.161	58	0.872
Self-protection	-1.05	58	0.298
Deprivation	2.335	58	0.023
Oppositionality	-0.214	58	0.832
Exploration	-2.267	58	0.027
Aggressiveness	2.097	58	0.04
BIAS	-1.636	58	0.107

The analysis of variance between groups (yoga instructors and informants not-practicing yoga) shows that there are statistically significant difference in dimensions Deprivation, Exploration, and Aggressiveness. Deprivation is more pronounced in control group, Aggressiveness as well, while Exploration is more pronounced in yoga instructors group. Significant differences in Deprivation could be attributed to the influence of observed factor, while differences in Exploration and Aggressiveness could be attributed to gender: Aggressiveness is higher in men, while Exploration is higher in women (there are more women in criteria than in control group).

The variable Aggressiveness is influenced by both factors (gender and group), but independently. Our results showed that the difference between these factors there is no relationship.

The variable Exploration is influenced by both factors, in the inter-reacting way, because their influence is not independent, they act together which can be proved from the results (there is interaction between these factors in particular variable).

According to Plutchik, Deprivation stands in average positive correlations with Aggressiveness and Exploration⁹. Also, Aggressiveness is highly negatively correlated with Exploration¹⁰, which was confirmed in our research. Informants who don't practice yoga has higher score in Aggressiveness, and lower in Exploration, while the opposite was noted for yoga instructors.

Inter-correlations between dimensions of PIE in control group show statistically significant negative correlation between Deprivation and Self-protection. In the group of yoga instructors, we noted statistically significant correlation between Deprivation and Orientation (Uncontrol).

Discussion

The main idea of this research was to determine if there were a connection between the continuous yoga practicing during the long period (and therefore the subjects were yoga instructors and persons who don't practice yoga) and means of stress overcoming. We hypothesized that every-day's practicing of yoga, breathing techniques, meditation and relaxation enables the better amortization of stress. Informants were tested with Profile Index Emotion (PIE) test.

In recent publications (Orneesh, D., 2007) it was reported that there is correlation between yoga practicing, vegetarian diet and relaxation techniques with breathing tech, and health condition in patients suffering of heart problems, and also that yoga and meditation plays a role in decreasing of stress, increasing of emotion regulation and slowing the effects of brain aging (Benson, H.).

Results of this research show that yoga practicing can be actually associated with the way of reacting to stress. There is significant difference in scores in three dimensions in two analyzed groups, and these are: Deprivation, Aggressiveness and Exploration, which are in average positive correlation according to Plutchik.

In this research we noted statistically significant difference between men and women in dimensions Aggressiveness and Exploration, and also the difference between criteria and control group in Deprivation.

Particularly important results of our research are those showing significant difference between two groups of informants in dimension Deprivation, independently on gender. Results show that the individuals don't practicing yoga have more pronounced melancholy, sadness, un-satisfaction with oneself and life perspectives in comparison with yoga instructors. They also feel higher emotional tension and inner emptiness, balderdash of presence and absence of future perspective, they press the troubles and conflicts instead of resolving them. Yoga instructors are more satisfied with their psychological situation which is the presumption for happiness and fulfillment. The person in such emotional state will be ready to react adequately to stress situations and to cope with them.

Those individuals who have higher score in Aggressiveness show higher tendency to arguing, antagonism, destruction. Usually persons living in the world of idea who diminish the reality are highly aggressive. However, high aggressiveness is the sing of natural and health expanse, need for growing and expressing oneself and his potentials, and a sign that the person will fight for his right if needed. Highly aggressive and destructive individuals with tendency to arguing will be hardly functional in stress situations. If we understand aggression as the character denoting assertiveness (standing for oneself and his rights without threatening other individuals), such kind of individuals are expected to be more adaptable in stress situations.

In regard to the fact that our research covered more male informants in control group, we couldn't conclude that the not-practicing of yoga is associated with high score in Aggressiveness.

⁹ Kostić, P. (2003). *Priručnik PIE – JRS*, Beograd, Društvo psihologa Srbije.

¹⁰ Kostić, P. (2003). *Priručnik PIE – JRS*, Beograd, Društvo psihologa Srbije.

Results with group of yoga instructors show decreased Aggressiveness and high score in Exploration, or lively need for understanding and knowing environment for presumption that the larger knowledge will bring the better functioning. These individuals use their life experience for coping with outer circumstances. Those are adequate and well-balanced personalities with solid self-control, they accomplish long lasting actions, they are ready to put a long lasting efforts to get to the goal. Using their intellectual efforts, they can successfully control their psychopathology.

In regard to the fact that our research covered more female informants in control group, we couldn't conclude that the practicing of yoga is associated with high score in Exploration.

The group of informants who don't practice yoga has low score in Exploration, which denotes rarely planning of future, disorganization in thinking and activities, and often is a sign of lacking the insight in inner person and his situation. We would need to conduct another similar research with controlling the variable Gender, to conclude that these characters were associated with non-practicing yoga. The only dimension which can be put in conclusion is Deprivation, since there was no gender influence in that case.

Individuals who practice yoga and meditation have better insight in their own perception, reaction and behavior in life situations. Through yoga practicing, we learn to be aware in everyday stress responding.

Conclusion

Research confirmed that the practicing of yoga, including asanas, breathing techniques, meditation and relaxation, contribute to better navigation in stress situations which are part of our daily life.

With practicing of yoga we achieve better emotional balance, absence of felling of denying and destruction, self-satisfaction, sensing the meaning of life, knowing of our way of reacting – though focusing our attention to actions within our body, slowing and deepening our breathing, balance of breathing and movements, physical and mental relaxation.

In this way, we also encourage the orientation to the presence, foundation in reality and perspectively looking into the future.

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